UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,189	07/31/2003	Claudia A. Iannotti	10021017-1	1422

7590 09/05/2006

AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER	
CROW, ROBERT THOMAS	
ART UNIT	**PAPER NUMBER**
1634	

DATE MAILED: 09/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/631,189	IANNOTTI ET AL.	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 15 June 2006 in which claims 1, 5, 6, 10, 12, 14, 15, 18, 21, 23, 24, 27, 28, 29, 32, and 37 were amended, no claims were canceled, and no claims were added. All of the amendments have been thoroughly reviewed and entered.

2. The previous rejections under 35 U.S.C. 112, second paragraph, are withdrawn in view of the amendments.

3. The previous rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) not reiterated below are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are addressed following the rejections necessitated by the amendments.

4. The previous rejections under statutory double patenting are withdrawn in view of the amendments.

5. The previous rejections under the judicially created doctrine of obviousness-type double patenting not reiterated below are withdrawn in view of the amendments.

6. Claims 1-37 are under prosecution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-8, 10-17, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avjioglu et al (U.S. Patent No. 5,480,972, issued 2 January 1996) in view of Colpan et al (U.S. Patent No. 6,383,393 B1, issued 7 May 2002) and in view of Haj-Ahmad et al (U.S. Patent 6,177,278, issued 23 January 2001).

Regarding claim 1, Avjioglu et al teach a method of preparing a sample substantially free of genomic DNA (e.g., isolation of mRNA; column 14, line 35-column 15, line 10); comprising the following steps:

forming a tissue or cell lysate from a biological sample (e.g., total RNA is isolated from plant tissues using the chaotropic agent guanidinium isothiocyanate; column 14, lines 35-40);

contacting a prefiltration column with said lysate (e.g., an oligo-(dT) cellulose spun column is used on the total RNA to isolate mRNA; column 14, line 60-column 4);

collecting a first effluent from said column, wherein said effluent is substantially free of genomic DNA (e.g., elution recovers poly(A+)RNA [column 15, lines 3-4]; because the column was loaded with a purified total RNA sample [column 14, lines 35-59] the purified total RNA is substantially free of genomic DNA, and the recovered poly(A+)RNA is therefore similarly substantially free of genomic DNA);

contacting a second column with said effluent (e.g., the RNA recovered from the first spun column is subjected to a second round of spun column chromatography; column 15, lines 6-7); and collecting said second effluent from the second column, wherein the second effluent is essentially free of genomic DNA (e.g., the isolated poly(A+)RNA constitutes over 90% of the sample; column 15, lines 5-10).

While Avjioglu et al teach columns for oligonucleotide probes with at least one layer of glass (e.g., columns are plugged with glass wool; column 20, lines 13-15), Avjioglu et al do not teach glass layers with columns used on cellular lysates or silicon carbide whisker columns.

However, Colpan et al teach a method of preparing a sample substantially free of genomic DNA (e.g., a method for purification and separation of nucleic acid mixtures; Abstract, lines 1-2), comprising the following steps:

forming a tissue or cell lysate from a biological sample (column 2, line 65);

contacting a pre-filtration column with said lysate (column 7, lines 30-36), wherein said pre-filtration column comprises a filter material, wherein said filter material has at least one layer of glass (column 7, lines 30-36); and

collecting the effluent from said column, wherein said effluent is substantially free of said genomic DNA (e.g., RNA is separated and purified through the use of chaotropic agents, column 6, lines 41-8), with the added benefit that adsorbing and desorbing the nucleic acids (i.e., on the glass of the column) results in excellent fractionation of nucleic acids (column 2, lines 30-34)

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the first column as taught by Avjioglu et al by with the glass filter material as taught by Colpan et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because the modification would have resulted in excellent fractionation of nucleic acids as explicitly taught by Colpan et al (column 2, lines 30-34)

While Colpan et al also teach use of the nucleic acid subsequent reactions (column 4, lines 15-21), Avjioglu et al in view of Colpan et al are silent with respect to silicon carbide columns.

However, Haj-Ahmad teaches a method of isolating a nucleic acid from a sample matrix comprising the following steps: forming a sample preparation by disrupting cells contained in said sample matrix using a lysis buffer (column 3, lines 19-24);

contacting a silicon carbide column with said sample preparation (column 3, lines 38-41), and eluting said nucleic from said silicon carbide column (column 3, lines 41-55) with the added benefit that silicon carbide is an affordable and readily available substance available in a variety of grades, each grade having a different capacity for binding nucleic acids (column 2, lines 30-35).

While Haj-Ahmad also teaches the preferred embodiment wherein the silicon carbide has an average particle size of 4.5 microns (column 4, lines 1-3), neither Haj-Ahmad nor Colpan et al specifically teaches silicon carbide whiskers. However, the specification does not define what is encompassed by the term "whisker." The term "whisker" has therefore been interpreted to be encompassed by the preferred embodiment of Haj-Ahmad, wherein the silicon carbide particles have an average particle size of 4.5 microns (column 4, lines 1-3). Thus, the claim has been given the broadest reasonable interpretation consistent with the specification (*In re Hyatt*, 211 F.3d1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (see MPEP 2111 [R-1])).

In addition, the courts have held that "where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device." (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), (see MPEP 2144.04, IVA). In the event that the instantly claimed "whiskers" are not encompassed by the micron sized particles of Haj-Ahmad, the instantly claimed "whiskers" would therefore merely be a form of silicon carbide having different relative dimensions than those of the prior art, and as such are not patentably distinct from the particles of Haj-Ahmad.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the second column as taught by Avjioglu et al in view of Colpan et al by using a silicon carbide column as taught by Haj-Ahmad with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because the modification

would have resulted in a column composed of an affordable and readily available substance available in a variety of grades, each grade having a different capacity for binding nucleic acids as explicitly taught by Haj-Ahmad (column 2, lines 30-35).

Regarding claim 2, the method of claim 1 is discussed above. Avjioglu et al also teach said lysate is formed employing a lysis buffer (column 14, lines 35-60) comprising a chaotropic agent (column 14, lines 39-42).

Regarding claim 3, the method of claim 2 is discussed above. Haj-Ahmad also teaches lysis with the chaotropic reagent guanidine hydrochloride (column 5, lines 14-18).

Regarding claim 4, the method of claim 2 is discussed above. Haj-Ahmad also teaches said chaotropic reagent is at a concentration ranging from about 0.5 M to about 5.0 M (column 5, lines 14-18).

Regarding claim 5, the method of claim 1 is discussed above. Colpan et al also teach said biological sample is cells (column 5, lines 64-67).

Regarding claim 6, the method of claim 5 is discussed above. Colpan et al also teach said cells are blood (column 5, lines 64-67).

Regarding claim 7, the method of claim 1 is discussed above. Colpan et al also teach said filter material has a particle retention ranging from about 0.1 microns to about 10 microns (e.g., the glass has a pore size of 1 micron; column 6, lines 60-67).

Regarding claim 8, the method of claim 1 is discussed above. Colpan et al also teach said filter material has a thickness ranging from about 50 microns to about 2000 microns (column 6, lines 60-67).

3. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avjioglu et al (U.S. Patent No. 5,480,972, issued 2 January 1996) in view of Colpan et al (U.S. Patent No. 6,383,393 B1, issued 7 May 2002) and in view of Haj-Ahmad et al (U.S. Patent 6,177,278, issued 23 January 2001) as applied to claim 1 above, and in view of the Aldrich Catalog (Aldrich Chemical Company, Milwaukee, WI, page T289 (1998/1999)).

Regarding claim 9, the method of claim 1 is discussed above. While Colpan et al also teach the use of glass fibers (column 6, lines 60-67), neither Avjioglu et al, Colpan et al, nor Haj-Ahmad et al teach the specific weight of the glass filters.

However, Aldrich teaches glass fibers suitable for use in chromatography that are 2 in diameter bundles that are 22 feet long, weighing 454 g (page T281, column 2, paragraph 1). A filter layer having a 2 in (5.08 cm) diameter has an area of 0.00203 m^2; therefore, a filter layer having a 2 in diameter and a length (i.e., the thickness of the layer in a column) of 0.25 in has a specific weight of 212 g/m^2, thereby meeting the limitation of the claim. Aldrich also teaches the glass fibers are strong and free of heavy metals (page T281, column 2, paragraph 1).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the method comprising the use of glass fibers as taught by Avjioglu et al in view of Colpan et al and Haj-Ahmad with the glass fibers as taught by Aldrich with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because the modification would have resulted in fibers that are strong and free of heavy metals as explicitly taught by Aldrich (page T281, column 2, paragraph 1).

4. Claims 10-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haj-Ahmad et al (U.S. Patent 6,177,278, issued 23 January 2001) in view of Colpan et al (U.S. Patent No. 6,383,393 B1, issued 7 May 2002).

Regarding claim 10, Haj-Ahmad teaches a method of isolating a nucleic acid from a sample matrix comprising the following steps:

forming a sample preparation by disrupting cells contained in said sample matrix using a lysis buffer (column 3, lines 19-24);

contacting a silicon carbide column with said sample preparation (column 3, lines 38-41);

and eluting said nucleic from said silicon carbide column (column 3, lines 41-55).

While Haj-Ahmad also teaches the preferred embodiment wherein the silicon carbide has an average particle size of 4.5 microns (column 4, lines 1-3), neither Haj-Ahmad nor Colpan et al specifically teaches silicon carbide whiskers. However, the Specification does not define what is encompassed by the term "whisker." The term "whisker" has therefore been interpreted to be encompassed by the preferred embodiment of Haj-Ahmad, wherein the silicon carbide particles have an average particle size of 4.5 microns (column 4, lines 1-3). Thus, the claim has been given the broadest reasonable interpretation consistent with the specification (*In re Hyatt*, 211 F.3d1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (see MPEP 2111 [R-1]).

In addition, the courts have held that "where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device." (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), (see MPEP 2144.04, IVA). In the event that the instantly claimed "whiskers" are not encompassed by the micron sized particles of Haj-Ahmad, the instantly claimed "whiskers" would therefore merely be a form of silicon carbide having different relative dimensions than those of the prior art, and as such are not patentably distinct from the particles of Haj-Ahmad.

While Haj-Ahmad teaches lysing of cells (column 3, lines 19-24), Haj-Ahmad is silent with respect to tissues.

However, Colpan et al teach a method for the isolating nucleic acid from a sample matrix (Abstract, lines 1-2) comprising using a column to purify the nucleic acid (column 7, lines 30-36) after forming a lysate from a biological sample including all tissues (column 5, lines 64-67) with the added benefit of allowing the study of tumors (column 11, lines 5-6).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the method of Haj-Ahmad to include the lysing of tissues as taught

by Colpan et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because the modification would have resulted in allowing the study of tumors as explicitly taught by Colpan et al (column 11, lines 5-6).

Regarding claim 11, the method of claim 10 is discussed above. Haj-Ahmad also teaches the method wherein said nucleic acid is RNA (Abstract, line 10).

Regarding claim 12, the method of claim 10 is discussed above. Colpan et al also teach DNA digestion (column 8, lines 61).

Regarding claim 13, the method of claim 10 is discussed above. Haj-Ahmad also teaches chaotropic agents are used in the sample preparation step (i.e., the sample preparation step; column 3, lines 19-24).

Regarding claim 14, the method of claim 13 is discussed above. Haj-Ahmad also teaches the method wherein the chaotropic reagent is guanidine hydrochloride (column 5, lines 14-18).

Regarding claim 15, the method of claim 13 is discussed above. Haj-Ahmad also teaches the method wherein said chaotropic reagent is at a concentration ranging from about 0.5 M to about 5.0 M (column 5, lines 14-18).

Regarding claim 16, the method of claim 10 is discussed above. Haj-Ahmad also teaches the method wherein one or more organic solvent binding enhancers are included in the sample preparation step (column 2, lines 47-48).

Regarding claim 17, the method of claim 16 is discussed above. Haj-Ahmad also teaches the method wherein said enhancer is ethanol (column 2, lines 47-48).

Regarding claim 18, the method of claim 10 is discussed above. Colpan et al also teach fritted columns with layers adjacent to frits (column 7, lines 21-30).

Regarding claim 19, the method of claim 10 is discussed above. Colpan et al also teach β-mercaptoethanol buffers (column 11, line 65).

Regarding claim 20, the method of claim 10 is discussed above. Haj-Ahmad also teaches the method wherein said lysis buffer has a pH in the range from about 4 to about 8 (column 4, lines 40-50).

Regarding claim 21, the method of claim 10 is discussed above. Haj-Ahmad also teaches the method wherein said eluting is performed using EDTA buffer (e.g., TE buffer; column 4, lines 40-49).

Regarding claim 22, the method of claim 21 is discussed above. While Haj-Ahmad teaches an elution buffer (e.g., TE buffer, column 4, lines 40-49), Haj-Ahmad is silent with respect to the pH of the elution buffer. However, TE buffers ranging in pH from about 4 to about 9 were well known in the art at the time the invention was made, as evidenced by the teaching of Colpan et al, wherein a nucleic acid elution TE buffer with a pH of 8.5 is disclosed (Example 1; column 8, lines 14-16).

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haj-Ahmad et al (U.S. Patent 6,177,278, issued 23 January 2001) in view of Colpan et al (U.S. Patent No. 6,383,393 B1, issued 7 May 2002) as applied to claim 10 above, and further in view of Crossway et al (U.S. Patent No. 4,996,144, issued 26 February 1991).

Regarding claim 23, the method of claim 10 is discussed above. While Colpan et al also teach DNA digestion (column 8, lines 61), neither Haj-Ahmad nor Colpan et al teach digestion with DNAse.

However, Crossway et al teach a method of purification of nucleic acids (e.g., RNA; Abstract, lines 3-5) using digestion with DNAse with the added benefit of allowing differential detection of RNA only (column 5, lines 60-63).

While Crossway et al do not teach the addition of a DNAse to nucleic acids bound to silicon carbide, the courts have held that selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results (*In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930); see MPEP 2144.04 [R-1] IV C). Therefore, the addition of a DNAse to the bound nucleic acids is an obvious variant in the order of steps as taught by Crossway et al.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the method of isolating a nucleic acid as taught by Colpan et al and Haj-Ahmad with the DNAse treatment as taught by Crossway et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because the modification would have resulted in allowing differential detection of RNA only as explicitly taught by Crossway et al (column 5, lines 60-63).

6. Claims 24-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avjioglu et al (U.S. Patent No. 5,480,972, issued 2 January 1996) in view of Colpan et al (U.S. Patent No. 6,383,393 B1, issued 7 May 2002), in view of Haj-Ahmad et al (U.S. Patent 6,177,278, issued 23 January 2001), and in view of Dove et al (U.S. Patent No. 5,006,472, issued 9 April 1991).

Regarding claim 24, Avjioglu et al teach a method of preparing a sample substantially free of genomic DNA (e.g., isolation of mRNA; column 14, line 35-column 15, line 10); comprising the following steps:

forming a tissue or cell lysate from a biological sample (e.g., total RNA is isolated from plant tissues using the chaotropic agent guanidinium isothiocyanate; column 14, lines 35-40);

contacting a prefiltration column with said lysate (e.g., an oligo-(dT) cellulose spun column is used on the total RNA to isolate mRNA; column 14, line 60-column 4);

collecting a first effluent from said column, wherein said effluent is substantially free of genomic DNA (e.g., elution recovers poly(A+)RNA [column 15, lines 3-4]; because the column was loaded with a purified total RNA sample [column 14, lines 35-59] the purified total RNA is substantially free of genomic DNA, and the recovered poly(A+)RNA is therefore similarly substantially free of genomic DNA);

contacting a second column with said effluent (e.g., the RNA recovered from the first spun column is subjected to a second round of spun column chromatography; column 15, lines 6-7); and

collecting said second effluent from the second column, wherein the second effluent is essentially free of genomic DNA (e.g., the isolated poly(A+)RNA constitutes over 90% of the sample; column 15, lines 5-10).

While Avjioglu et al teach columns for oligonucleotide probes with at least one layer of glass (e.g., columns are plugged with glass wool; column 20, lines 13-15), Avjioglu et al do not teach glass layers with columns used on cellular lysates, silicon carbide whisker columns, or DNAse.

However, Colpan et al teach a method of preparing a sample substantially free of genomic DNA (e.g., a method for purification and separation of nucleic acid mixtures; Abstract, lines 1-2), comprising the following steps:

forming a tissue or cell lysate from a biological sample (column 2, line 65);

contacting a pre-filtration column with said lysate (column 7, lines 30-36), wherein said pre-filtration column comprises a filter material, wherein said filter material has at least one layer of glass (column 7, lines 30-36); and

collecting the effluent from said column, wherein said effluent is substantially free of said genomic DNA (e.g., RNA is separated and purified through the use of chaotropic agents, column 6, lines 41-8), with the added benefit that adsorbing and desorbing the nucleic acids (i.e., on the glass of the column) results in excellent fractionation of nucleic acids (column 2, lines 30-34)

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the first column as taught by Avjioglu et al by with the glass filter material as taught by Colpan et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because the modification would have resulted in excellent fractionation of nucleic acids as explicitly taught by Colpan et al (column 2, lines 30-34)

While Colpan et al also teach use of the nucleic acid subsequent reactions (column 4, lines 15-21), as well as DNA digestion (column 8, lines 61), Avjioglu et al in view of Colpan et al does not teach digestion with DNAse or silicon carbide columns.

However, Haj-Ahmad teaches a method of isolating a nucleic acid from a sample matrix comprising the following steps: forming a sample preparation by disrupting cells contained in said sample matrix using a lysis buffer (column 3, lines 19-24);

contacting a silicon carbide column with said sample preparation (column 3, lines 38-41), and eluting said nucleic from said silicon carbide column (column 3, lines 41-55) with the added benefit that silicon carbide is an affordable and readily available substance available in a variety of grades, each grade having a different capacity for binding nucleic acids (column 2, lines 30-35).

While Haj-Ahmad also teaches the preferred embodiment wherein the silicon carbide has an average particle size of 4.5 microns (column 4, lines 1-3), neither Haj-Ahmad nor Colpan et al specifically teaches silicon carbide whiskers. However, the Specification does not define what is encompassed by the term "whisker." The term "whisker" has therefore been interpreted to be encompassed by the preferred embodiment of Haj-Ahmad, wherein the silicon carbide particles have an average particle size of 4.5 microns (column 4, lines 1-3). Thus, the claim has been given the broadest reasonable interpretation consistent with the specification (*In re Hyatt*, 211 F.3d1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (see MPEP 2111 [R-1]).

In addition, the courts have held that "where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device." (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), (see MPEP 2144.04, IVA). In the event that the instantly claimed "whiskers" are not encompassed by the micron sized particles of Haj-Ahmad, the instantly claimed "whiskers" would therefore merely be a form of silicon carbide having different relative dimensions than those of the prior art, and as such are not patentably distinct from the particles of Haj-Ahmad.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the second column as taught by Avjioglu et al in view of Colpan et al by using a silicon carbide column as taught by Haj-Ahmad with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because the modification would have resulted in a column composed of an affordable and readily available substance available in a variety of grades, each grade having a different capacity for binding nucleic acids as explicitly taught by Haj-Ahmad (column 2, lines 30-35).

Neither Avjioglu et al, Colpan et al, nor Haj-Ahmad teach DNAse.

However, Dove et al teach a method of preparing a sample (e.g., a purification process using enzymatic treatment; Abstract) comprising contacting nucleic acids bound to a column with DNAse, under conditions suitable for DNAse digestion (e.g., DNA is degraded when it is bound by DNAse that is immobilized on a column [column 3, lines 20-24]; therefore, when the DNA is bound to the immobilized DNAse, the DNA is bound to the column and contacts the DNAse) with the added advantage that the treatment results in the degradation of undesirable residual nucleic acids (Abstract).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the second column as taught by Avjioglu et al in view of Colpan et al and Haj-Ahmad with the DNAse as taught by Dove et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because the modification would have resulted in the degradation of undesirable residual nucleic acids as explicitly taught by Dove et al (Abstract).

Regarding claim 25, the method of claim 24 is discussed above. Avjioglu et al also teach the method wherein said nucleic acid is RNA (column 14, line 35-column 15, line 10).

Regarding claim 26, the method of claim 24 is discussed above. Colpan et al also teach DNA digestion (e.g., restriction; column 8, line 61). As discussed above the courts have held that selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results

(*In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930); see MPEP 2144.04 [R-1] IV C). Therefore, the inclusion of digestion in the first effluent collection step is an obvious variant in the order of steps as taught by Colpan et al.

Regarding claim 27, the method of claim 24 is discussed above. Avjioglu et al also teach said lysate is formed employing a lysis buffer (column 14, lines 35-60) comprising a chaotropic agent (column 14, lines 39-42).

Regarding claim 28, the method of claim 27 is discussed above. Colpan et al also teach the method wherein the chaotropic reagent is guanidine hydrochloride (Example 1, column 7, lines 64-66).

Regarding claim 29, the method of claim 27 is discussed above. Colpan et al also teach the method wherein said chaotropic reagent is at a concentration ranging from about 0.5 M to about 5.0 M (Example 1, column 7, lines 64-66).

Regarding claim 30, the method of claim 24 is discussed above. Colpan et al also teach the method wherein one or more organic solvent binding enhancers are included in the sample preparation step (column 5, lines 25-28).

Regarding claim 31, the method of claim 30 is discussed above. Colpan et al also teach the method wherein said enhancer is ethanol (column 5, lines 25-28).

Regarding claim 32, the method of claim 24 is discussed above. Colpan et al also teach fritted columns with layers adjacent to frits (column 7, lines 21-30).

Regarding claim 33, the method of claim 24 is discussed above. Colpan et al also teach β-mercaptoethanol buffers in the sample preparation step (column 11, line 65).

Regarding claim 34, the method of claim 24 is discussed above. Colpan et al also teach the method wherein said lysis buffer has a pH in the range from about 4 to about 8 (column 11, lines 63-65).

Regarding claim 35, the method of claim 24 is discussed above. Haj-Ahmad also teaches the method wherein said elution is performed using EDTA buffer (e.g., TE buffer; column 4, lines 40-49).

Regarding claim 36, the method of claim 35 is discussed above. While Haj-Ahmad teaches an elution buffer (e.g., TE buffer, column 4, lines 40-49), Haj-Ahmad is silent with respect to the pH of the elution buffer. However, TE buffers ranging in pH from about 4 to about 9 were well known in the art at the time the invention was made, as evidenced by the teaching of Colpan et al, wherein a nucleic acid elution TE buffer with a pH of 8.5 is disclosed (Example 1; column 8, lines 14-16).

7. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avjioglu et al (U.S. Patent No. 5,480,972, issued 2 January 1996) in view of Colpan et al (U.S. Patent No. 6,383,393 B1, issued 7 May 2002), in view of Haj-Ahmad et al (U.S. Patent 6,177,278, issued 23 January 2001), in view of Dove et al (U.S. Patent No. 5,006,472, issued 9 April 1991) as applied to claim 34 above, and further in view of Crossway et al (U.S. Patent No. 4,996,144, issued 26 February 1991).

Regarding claim 37, the method of claim 24 is discussed above. While Colpan et al also teach DNA digestion (column 8, lines 61), neither Avjioglu et al, Colpan et al, Haj-Ahmad, nor Dove et al teach additional digestion with DNAse.

However, Crossway et al teach a method of purification of nucleic acids (e.g., RNA; Abstract, lines 3-5) using additional digestion with DNAse with the added benefit of allowing differential detection of RNA only (column 5, lines 60-63).

As noted above, the courts have held that selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results (*In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930); see MPEP 2144.04 [R-1] IV C). Therefore, the additional DNAse digestion of the final eluate is an obvious variant in the order of steps as taught by Crossway et al.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the method of isolating a nucleic acid as taught by Colpan et al and Haj-Ahmad with the DNAse treatment as taught by Crossway et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because the

modification would have resulted in allowing differential detection of RNA only as explicitly taught by Crossway et al (column 5, lines 60-63).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 7-9 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 and 14 of copending Application No. 10/914,920 in view of Haj-Ahmad (U.S. Patent No. 6,177,278 B1). Both sets of claims are drawn to methods of purification using pre-filtration columns having a glass or borosilicate layer and contacting the effluent with a second column that allows separation of RNA. Claims 1, 7-12, and 14 are drawn to and RNA isolation column, but are silent with respect to silicon carbide whiskers.

However, Haj-Ahmad teaches purification of RNA (Abstract) using silicon carbide particles (Abstract), including the preferred embodiment wherein the silicon carbide has an average particle size of 4.5 microns (column 4, lines 1-3). While Haj-Ahmad also teaches the preferred embodiment wherein the silicon carbide has an average particle size of 4.5 microns (column 4, lines 1-3), neither Haj-Ahmad nor Colpan et al specifically teaches silicon carbide whiskers. However, the Specification does not define

what is encompassed by the term "whisker." The term "whisker" has therefore been interpreted to be encompassed by the preferred embodiment of Haj-Ahmad, wherein the silicon carbide particles have an average particle size of 4.5 microns (column 4, lines 1-3). Thus, the claim has been given the broadest reasonable interpretation consistent with the specification (*In re Hyatt*, 211 F.3d1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (see MPEP 2111 [R-1]).

In addition, the courts have held that "where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device." (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), (see MPEP 2144.04, IVA). In the event that the instantly claimed "whiskers" are not encompassed by the micron sized particles of Haj-Ahmad, the instantly claimed "whiskers" would therefore merely be a form of silicon carbide having different relative dimensions than those of the prior art, and as such are not patentably distinct from the particles of Haj-Ahmad.

Haj-Ahmad also teaches that silicon carbide in an economical medium for use in purification of nucleic acids (column 2, lines 24-38).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the claims of the '920 application with the silicon carbide particles of Haj-Ahmad with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because the modification would have resulted in and economical medium for use in purification of nucleic acids as explicitly taught by Haj-Ahmad (column 2, lines 24-38).

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

Applicant's arguments filed 15 June 2006 (i.e., "the Remarks") are considered below.

1. Applicant's arguments with respect to claims 1-9 on pages 8-9 of the Remarks have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's argues on pages 10, 11, and 12 of the Remarks that neither Colpan et al nor Haj-Ahmad teach silicon carbide whiskers, and that it is not obvious to substitute silicon carbide whiskers for the grit or powder material, because silicon carbide whiskers "perform significantly different that the grit or powder used by Haj-Ahmad (Remarks, page 10, first full paragraph)."

However, the courts have held that evidence relied upon should establish "that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance" (*Ex parte Gelles*, 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Inter. 1992); MPEP 716.02(b) [R-2] I). Haj-Ahmad explicitly teaches that silicon carbide "is available in a variety of grit sizes or grades, and **each grade has a different capacity for binding nucleic acids** (column 2, lines 30-35; emphasis added)." Differences in the performance of the different grit sizes or grades are therefore expected and obvious in view of the teachings of Haj-Ahmad.

In addition, as stated above, the courts have held that "where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device." (*Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), (see MPEP 2144.04, IVA). In the event that the instantly claimed "whiskers" are not encompassed by the micron sized particles of Haj-Ahmad (column 4, lines 1-3), the instantly claimed "whiskers" would therefore merely be a form of silicon carbide having different relative dimensions than those of the prior art, and as such are not patentably distinct from the particles of Haj-Ahmad.

3. Applicant's arguments on pages 13-14 of the Remarks concerning the double patenting rejections have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

1. No claim is allowed.

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP§706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

3. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571) 272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert T. Crow
Examiner
Art Unit 1634

JULIET C. SWITZER
PRIMARY EXAMINER

JULIET C. SWITZER
PRIMARY EXAMINER

JULIET C. SWITZER
PRIMARY EXAMINER